NA MFO

3420 Pest Management Evaluations April 1, 1985

Gypsy Moth Population Data -
Allegheny National Forest

Forest Supervisor
Allegheny National Forest

This memo presents some of the additional data we obtained last autumn about gypsy moth populations on your Forest.

During the gypsy moth egg mass surveys, egg masses of this defoliator were sampled to evaluate egg parasitism and viability for the 1984-1985 gypsy moth population. This information was considered important for: 1) the overall assessment of the potential defoliation to be expected during 1985; and 2) the recognition of trends in population limiting factors in subsequent years.

The small encyrtid wasp, Ooeneytus kuvanae (Howard), accounts for virtually all the egg parasitism in Pennsylvania. This insect was first imported from Japan during 1905 to 1914 for release against the gypsy moth in New England where it became established as the major parasite of the gypsy moth egg stage. Later releases during the 1960's and 1970's in New Jersey firmly set O. kuvanae in this role in States west of New England. As the gypsy moth population naturally has spread westward and southward, O. kuvanae has followed, but at a 1-3 year lag behind the initial gypsy moth outbreak. Research has shown that the wasp is able to parasitize eggs in only the outermost layer or two of undisturbed gypsy moth egg masses. Since large egg masses are the rule during outbreaks, O. kuvanae exerts only limited control on a given mass. However, numerous gypsy moth egg masses favor an increase of this wasp until the time when populations of its host rapidly decline. Then, when host egg masses are smaller, O. kuvanae exerts its greatest (up to 30 percent) parasitism. This level of parasitism potentially can maintain endemic gypsy moth populations, although rapid population buildup of gypsy moth usually out paces that of O. kuvanae.

The enclosed map locates the twenty sites at which we collected fifteen egg masses. Fifteen egg masses were taken from the lower six feet of at least five trees at site. Table 1 shows that we made collections in all of the Entomological areas.

The collected egg masses were dehaired and volumetrically assayed for egg density per mass. Then, the eggs were sorted and counted as to whether or not each contained a fully embryonated gypsy moth larvae or a parasitic wasp or remained infertile.

Table 2 summarizes the data we obtained from the egg mass survey plots and the fifteen egg masses we collected at each of twenty sites. Estimates of average egg masses per acre at 14 of the sites were at or above the density (about 700) at which moderate or greater defoliation would occur. The average number of eggs in a mass ranged from a low of 363 to a high of 665 over all sites.

Infertile eggs were infrequently encountered and did not average any more than 1.7 percent at any sites. The average percentage of parasitized eggs in sampled masses at each site were uniformly low (0.6-1.2 percent) over all sites except the one near Bear Creek where parasitism averaged 20.9 percent. Consequently, egg viability was high throughout most of the oak type of the Allegheny National Forest.

It is interesting to note that the highest parasitism was observed in part of the Allegheny National Forest where the gypsy moth has been present the longest. This area is just north of the Pennsylvania State lands and private lands below the Clarion River which experienced moderate to severe defoliation in 1985.

In summary, we conclude that the gypsy moth outbreak predicted for most of your Forest this spring will be unaffected by parasitism from the major gypsy moth egg parasite, Ooencyrtus kuvanae. Furthermore, the egg masses are moderately large with most eggs viable. An assessment of gypsy moth egg masses for O. kuvanae will be made again next fall at the same sites on the Forest to determine the trends for this egg parasite.

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REA/gjc

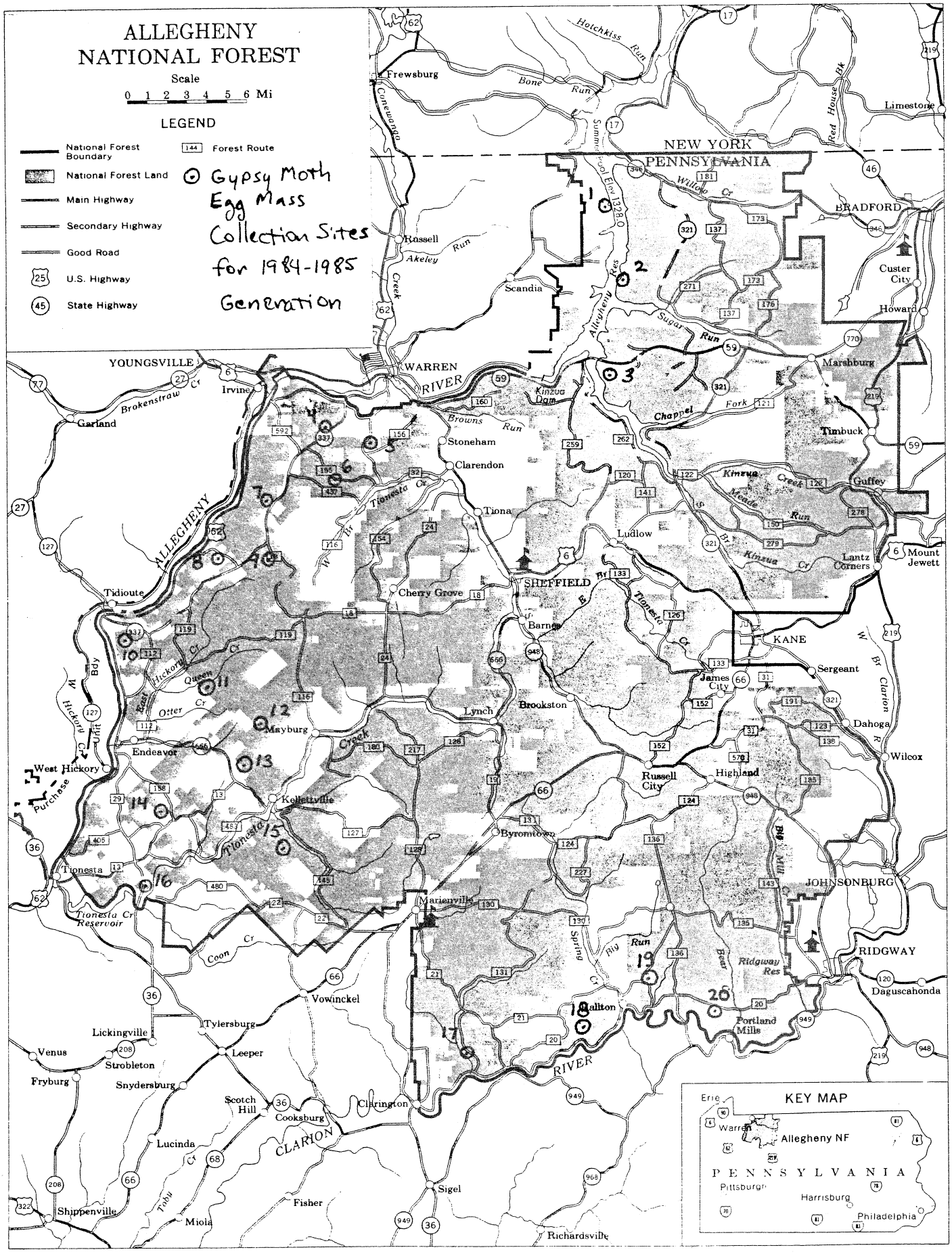
ALLEGHENY
NATIONAL FOREST
Scale
0 1 2 3 4 5 6 Mi
LEGEND
National Forest Boundary
National Forest Land
Main Highway
Secondary Highway
Good Road
U.S. Highway
State Highway
Forest Route
Gypsy Moth
Egg Mass
Collection Sites
for 1984-1985
Generation
NEW YORK
PENNSYLVANIA
WARREN
YOUNGSVILLE
Irvine
Garland
Brokenstraw Cr
Frewsburg
Bone Run
Hotchkiss Run
Conewango Cr
Limestone
Red House Bk
Russell
Akeley Run
Scandia
Allegheny Res
Willow Cr
BRADFORD
Custer City
Howard
Sugar Run
Marshburg
Kinzua Dam
Chappel Fork
Timbuck
Browns Run
Stoneham
Clarendon
Tionesta Cr
Tiona
Ludlow
Guffey
Kinzua Creek
Mead Run
Lantz Corners
Mount Jewett
ALLEGHENY RIVER
Tidioute
Cherry Grove
SHEFFIELD
Barnes
KANE
Sergeant
James City
Brookston
Lynch
Mayburg
Hickory Cr
Queen Cr
Otter Cr
Endeavor
West Hickory
Purchase Unit
Kellettville
Tionesta Cr
Dahoga
Wilcox
Russell City
Highland
Byromtown
Tionesta
Tionesta Cr Reservoir
Marienville
JOHNSONBURG
RIDGWAY
Ridgway Res
Daguscahonda
Coon Cr
Vowinckel
Tylersburg
Lickingville
Venus
Strobleton
Leeper
Fryburg
Snydersburg
Scotch Hill
Cooksburg
Clarington
Portland Mills
Lucinda
CLARION RIVER
Shippenville
Miola
Fisher
Sigel
Richardsville
KEY MAP
Erie
Warren
Allegheny NF
PENNSYLVANIA
Pittsburgh
Harrisburg
Philadelphia

Table 1. GYPSY MOTH EGG MASS COLLECTION SITES FOR THE 1984-1985 GENERATION ON THE ALLEGHENY NATIONAL FOREST

Site No.	Ranger District	Entomological Area	Location Notes
1	Bradford	Hooks Brook	Campground
2	Bradford	Tracy Ridge	Hopewell
3	Bradford	Rimrock	Rimrock Overlook
4	Sheffield	Grunderville	Rd 362,plots 7,8,9
5	Sheffield	Clarendon	Mohawk Rd, plots 1,2,3
6	Sheffield	Chapman	Rd.155,plots 4,5,6
7	Sheffield	Allegheny Front	Rd.573,plots 6,7,8
8	Sheffield	Bimber/McKean	Bully Hill Rd.plots 15,16
9	Sheffield	Sandstone Spgs.	Hearts Content Rd.(18), plots 1,2,3
10	Sheffield	Redhouse/Kelly Hill	Rd.416 SW of Izenbrown Corners, plots 1,2,3
11	Sheffield	Yellow Hammer	Rd.551, plots 7,8,9
12	Sheffield	Beaver Run	Junction 449&450,plots1-3
13	Sheffield	Kelletville	Balltown Rd.,plots 10-12
14	Marienville	Tionesta	Rd.493, plots 2,3,4
15	Marienville	Hickory	Rd.487, plots 6&7
16	Marienville	Guitonville	Rd.212, plots 4,5,6
17	Marienville	Millstone	Gregg Hill, plots 4,5,6
18	Marienville	Painter Run	Rd.383, plots 7,8,9
19	Ridgeway	Beuhler Corners	Rd.343, plots 13,14,15
20	Ridgeway	Bear Creek	Rd.20, plots 13,14,15

Table 2. GYPSY MOTH EGG MASS DATA FOR 1984-1985 GENERATION ON THE ALLEGHENY NATIONAL FOREST

Site No.	EM/acre	Total Eggs/ Egg Mass	% Infertile Eggs/ Mass	% Parasitized Eggs/Mass	% Viable Eggs per Mass
1	856±177	482±64	1.7	1.2	97.1
2	1600±973	665±123	0.9	1.0	98.1
3	915±322	500±94	0.7	0.5	98.8
4	919±327	498±82	0.5	1.1	98.4
5	735±565	491±85	0.3	0.8	98.9
6	551±534	681±119	0.9	0.3	98.8
7	412±143	614±96	0.4	0.7	98.9
8	928±194	608±143	0.4	0.4	99.2
9	772±364	542±93	0.6	1.0	98.4
10	611±200	527±111	1.2	0.4	98.4
11	671±454	565±107	0.9	1.2	97.9
12	1094±606	561±112	1.1	0.7	98.2
13	4844±3455	508±123	1.4	0.5	98.1
14	780±809	551±97	0.7	0.9	98.4
15	1908±630	420±97	0.4	0.9	98.7
16	1258±1957	616±139	0.7	0.2	99.1
17	762±153	363±105	0.5	0.4	99.1
18	282±136	451±93	1.0	0.4	98.6
19	275±246	475±141	1.1	0.3	98.6
20	289±221	492±108	1.0	20.9	78.1